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ABSTRACT

Since counselors and teachers have found that special materials are often needed to help counter sex role stereotyping and to help young women make more realistic career decisions, this paper lists various resources which have been developed and used by colleges and universities in counseling and recruiting women for careers formerly considered "for men only." Presented in four parts, the first section reviews some programmatic approaches to recruiting women to enter traditionally "male" fields. The second section discusses some examples of special recruiting materials, and the third section lists a sampling of available publications and resource groups in selected fields. The final section lists resources that may be especially helpful in recruiting minority women. (BM)

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project on the status and education of **women**

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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Recruiting Women for Traditionally "Male" Careers: Programs and Resources for Getting Women Into the Men's World

Women are the fastest growing sector of the labor force. Between 1950 and 1974 the number of working women nearly doubled. Even with breaks in employment due to childbearing and childrearing, the average woman worker today has a worklife expectancy of 25 years. Projections are that this worklife expectancy will increase in years to come, since more women are choosing to remain in the labor force full time after starting families, or are returning to the workforce while their children are still very small. The recent increase in the number of women entering college will lengthen the worklife of women, since the more education a woman has, the more likely she is to work.

However, the majority of women workers, even those who have college degrees, earn low salaries. The average salary for a woman with a bachelor's degree who works full time is about the same as that of a man who is a high school drop out. This low earning rate is due largely to the fact that women workers remain concentrated in a few major occupations, and the majority of women professionals are concentrated in the lower paying, traditionally "female" professional fields.

Until very recently societal expectations and educational barriers discouraged and often prevented American women from entering professions such as medicine, law and science. These prestigious and well-paying fields have traditionally been the province of men. In 1970, for example, about 30% of the male professionals were employed in such high-paying fields as engineering, law and medicine, compared to only 2% of women professionals employed in these fields. In the last several years, however, there has been a marked increase in the number and percentage of women entering such professions. Between 1970 and 1975, the number of women receiving first professional degrees in law, medicine, dentistry and other professions increased by 184%.

The annual national survey of college freshmen conducted by the American Council on Education and the University of California at Los Angeles gives further evidence of the changing aspirations of young women. In 1966 the percentage of women freshmen planning careers in male-dominated fields was 5.9%. By 1975 this percentage had more than doubled: 16.9% of freshmen women wanted careers in law, medicine, business and other traditionally male professions. A year later, the percentage had increased to 19.4%. This percentage is expected to continue to grow as business and industry recruit, employ and promote women in management, technical and professional jobs. The resulting increase in the number of role models for young women will help to further stimulate interest in these fields.

However, even with the shift and increase in aspirations of women, old myths and sex role stereotypes persist. Counselors and teachers have found that special materials are often needed to help counter these myths and help young women make more realistic career decisions.[1] This paper lists various resources which have been developed and used by colleges and universities in counseling and recruiting women for careers formerly considered "for men only."

The paper is in four parts: the first section reviews some programmatic approaches to recruiting women to enter traditionally "male" fields. The second section discusses some examples of special recruiting materials. The third lists a sampling of available publications and resource groups in selected fields. The final section lists resources that may be especially helpful in recruiting minority women.

I. SPECIAL PROGRAMS

Conferences, workshops, summer programs, residency programs—all have been used to encourage high school and college-age women to consider studying non-traditional disciplines.[2] The following are examples of some of these efforts.

[1] Title IX of the Education Amendments of 1972 permits special recruiting programs. Section 86.23(a) of the regulation implementing the statute states that ". . . a recipient may be required to undertake additional recruitment efforts for one sex as a remedial action. . . ." An institution, in an effort to overcome the effects of past discriminatory practices, may engage in activities designed to interest women students in fields where they are underrepresented. Additionally, Section 86.36(b) allows materials for counseling students to be aimed at one sex where "the use of such different materials is shown to be essential to eliminate sex bias." Thus, materials designed to encourage women to enter fields such as medicine or to encourage men to enter such fields as nursing do not violate Title IX.

[2] In some instances, federal funds may be available for such programs. The National Science Foundation has funded studies and experimental projects related to careers for women in science. For further information contact Women in Science Program, National Science Foundation, 1800 F St., NW, Washington, DC 20006. Another possible source of federal funds is the Women's Educational Equity Act Program which is designed to support a broad range of activities that target on sex bias and to provide equity for women in education at all levels. For further information contact Women's Program Staff, U.S. Office of Education, Department of Health, Education and Welfare, Washington, DC 20202.

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THE PROJECT ON THE STATUS AND EDUCATION OF WOMEN of the Association of American Colleges provides a clearinghouse of information concerning women in education, and works with institutions, government agencies and other associations and programs affecting women in higher education. The project is funded by Carnegie Corporation of New York. Publication of these materials does not necessarily constitute endorsement by AAC or Carnegie Corporation of New York. This publication may be reproduced in whole or part without permission, provided credit is given to the Project on the Status and Education of Women, Association of American Colleges, 1818 R Street, NW, Washington, D C 20009.

Career workshop or conference–a one or two day session held at a university, and aimed at high school and junior high school women. Often parents, counselors and teachers are also invited. Either a very low fee or no fee at all is charged. Program content includes films and exhibits on women in scientific, technical and/or professional fields, women professionals as speakers and workshop leaders; workshops for parents and teachers to advise them of educational needs, admissions processes, and financial aid sources; and tours of the university's scientific and other training facilities. In addition, the conference may include tours or on-site workshops in industrial and/or business settings such as research laboratories, factories, hospitals, corporations, etc.

Science career program–a longer program, lasting from one to six weeks, usually residential, aimed at junior and senior high school women students, and held on a college or university campus. Program content includes not only workshops on career opportunities, but also regular coursework in math, physics, biology and other scientific disciplines taught by the institution's regular faculty and/or by professionals from business, industry or the government. These programs are substantially enhanced when they also include field trips to various employment settings, small group sessions with women professionals and personal counseling.

Peer advocacy–the utilization of women students currently enrolled in an institution, who have already chosen a particular discipline as mentors for potential women students. Peer advocates can augment a conference or workshop by serving as hosts, guides or workshop participants and facilitators. In longer programs they may serve as group leaders and counselors assigned to a small group of the program participants. As part of an institution's general recruiting strategy women peer advocates might visit high schools (or graduate students might visit undergraduate institutions) to encourage both female and male potential applicants to enter a certain field. Peer advocates can also play an important role in retention and support programs aimed at students already enrolled.

Professional-in-residence program–a woman who is a professional in a scientific or male-dominated career field is invited for a period of time ranging from one week to an academic year, to reside on campus. This is especially useful on a campus where there are no or few professional women to serve as role models or mentors. The professional not only conducts seminars and gives lectures, but also talks informally with small groups of students or individual women who have questions regarding career opportunities for women.

Math anxiety clinic–because women are frequently locked out of scientific and technical careers due to poor high school preparation in mathematics, several institutions have established "math clinics" or "math anxiety programs" in various formats.

- Math "exploration" for girls–a short term effort (1-2 days) for junior high and high school girls, in the form of workshops which focus on the use of math in various professions. The workshops are designed to encourage active participation and experimentation in math, and to alleviate the fear of math many girls have developed by the time they reach junior high.
- Math anxiety clinic for college students–offered during the academic year, the clinic utilizes lectures, laboratory, tutoring and counseling, and special teaching methods designed to decrease anxiety and increase student interest and competency in math.
- Training workshop for teachers of math–a short term workshop for teachers and counselors to teach them how to teach math so that anxiety is decreased.

Re-entry program–usually sponsored by an institution, this program is aimed at attracting women who already hold degrees in science or math, but who may not be presently working in the field. The curriculum of the program consists of courses, frequently accelerated, which are designed to bring the participants up-to-date in their fields, and to prepare them for jobs in scientific areas or for graduate study. Since such programs are aimed at older (22 and over) women, stipends to cover child care expenses may be offered, and tuition is generally very low or not required.

II. SPECIAL RECRUITING MATERIALS

Many institutions have published special materials designed for recruiting women to the institution or to a specific school, college or department within the institution. *Women at Wisconsin Are In* is a short booklet which describes the wide range of learning opportunities for women at the University of Wisconsin. *A Woman's Book*, a 28-page booklet by Tufts University (MA), includes a description of academic programs, the history of women at the university, and available support services for women. A third example is *Career Information for Women*, a 52-page booklet which describes 22 technical careers for which women can train at Catonsville Community College (MD). In addition to information on job opportunities in the various careers, the booklet contains photographs of women students, accompanied by a quote giving their reasons for choosing their particular field of study. The University of Hawaii Medical School has a poster showing Native Hawaiian, Asian, black and white women medical students under the caption, "We're Going to Be Doctors." The poster states that "medicine is not for men only" and that the school "actively encourages young women to apply." The name and address of the admissions committee chairwoman is given also. In the school's admission brochure, a section entitled "Sex of Applicant" affirms the school's commitment to encourage women students.

Institutions might also highlight women students in publications that reach alumni, trustees and others concerned with the academic community. "Women's Achievement" was the theme of the *Bradley University Magazine*, (IL) August 1976 issue. The

magazine reported on the impact women had had on the university, noting that of 33 students graduating that spring with highest honors, 24 were women. Also included were separate features on four women who ranked top of their classes in the Colleges of Business Administration, Engineering and Technology, Liberal Arts and Education.

In addition to preparing special materials, institutions often revise existing standard promotional materials, such as course catalogs, brochures, posters, films, etc. to better reflect women's opportunities in the academic community and, by inference, in the world at large.[3] With recruitment of women as an underlying goal, such materials typically include the following:

- bias-free language (e.g., avoiding words such as "lady lawyer," and the practice of using "he" as a generic term);
- women in photographs and illustrations, showing them in active, non-stereotypic roles[4] in all phases of academic life; and
- statements of assurance that the institution complies with federal laws prohibiting sex discrimination.[5]

In addition to printed media, some institutions have used the electronic media to reach potential women students. Radio and television stations, both commercial and public, frequently provide free or low cost air time for spot announcements by non-profit organizations.

III. RESOURCES BY FIELD

Although some of these materials were written for recruiting women to a particular school, the materials may be of use to other institutions considering the development of similar recruiting materials. Additionally, the general information in the materials is likely to be helpful to persons considering that field, whether or not they apply to the specific institution.

Medicine and Health Fields

The percentage of women enrolled in medical schools has climbed consistently over the past few years. Women comprised 9.0% of the enrollment in medical schools in 1969; 12.8% in 1972, and 15.4% in 1973. The Association of American Medical Colleges reports that in 1977, women accounted for 22% of the total enrollment and were 25% of the freshman class.

The National Center for Education Statistics reports that the percentage of women enrolled in schools of veterinary medicine has increased from 8.8% in 1969-70 to 20.4% in 1974-75. The percentage of women enrolled in dental schools increased from 1.4% in 1969-70 to 7.0% in 1974-75.

The following publications were written especially for women considering a medical career:

Medicine: A Woman's Career is a booklet published by the American Medical Women's Association, an organization of women physicians. The booklet offers advice on educational preparation, medical curricula requirements, and sources of financial aid. 12 pages. COST: $1.00 prepaid. Bulk rates available. ORDER FROM: AMWA, 1740 Broadway, New York, NY 10019.

Why Would a Girl Go Into Medicine? Medical Education in the United States: A Guide for Women, by Margaret A. Campbell, M.D., is based on a survey of women's experiences in medical schools across the country. Dr. Campbell discusses her findings and suggests strategies for coping with and eliminating sex discrimination in medical schools. 126 pages. COST: $3.50. ORDER FROM: The Feminist Press, Box 334, Old Westbury, NY 11568.

Women in Medicine, published by the Stanford University School of Medicine discusses the participation of women in medicine in the United States and gives particular details on the Stanford Medical School program. 15 pages. COST: Single copies free upon request. ORDER FROM: Stanford University School of Medicine, Stanford University, Palo Alto, CA 94305.

Pathways to a Career in Dentistry is a sourcebook compiled and published by Technical Education Research Centers and Tufts University School of Dental Medicine. Directed to women and minority group members, the sourcebook describes dentistry, details the admissions process for dental school, and gives lists of general resources, films and exhibits, dental societies and accredited dental schools in the United States. 125 pages. COST: $5.00. ORDER FROM: Technical Education Research Centers, 44 Brattle St., Cambridge, MA 02138.

The following studies, written for purposes other than recruiting, may nevertheless be useful in planning workshops, seminars and other activities related to recruiting women into health and/or medical fields.

Men and Women in the College of Veterinary Medicine: Their Comments About Student Services, is a report prepared by Charlene V. Follett, Darwin D. Hendel, and Wendy L. Andberg Klohs of the University of Minnesota. The report is based on a survey of the university's veterinary medical students, their educational experience and their career expectations. The report focuses on students' attitudes about career and family, interactions with faculty and classmates, perceptions of differential treatment based on sex, and problems encountered in the college. 87 pages. COST: $1.00. Supply limited. ORDER FROM: Wendy Andberg Klohs, College of Veterinary Medicine, 301 Veterinary Science Bldg., University of Minnesota, St. Paul, MN 55101.

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[3] Institutions were required to conduct a self-evaluation under the Title IX regulation prior to July 1976. This evaluation required examination of recruiting and admissions procedures. See Section 86.3(c)(i) of the regulation.

[4] Some materials in the past have shown women students only as dates of male students, as cheerleaders or as beauty queens.

[5] Section 86.9(b) of the Title IX regulation requires that a policy statement concerning nondiscrimination appear in each announcement, bulletin, catalog or application form made available to students and applicants or used in recruiting.

An Exploratory Study of Women in the Health Professions Schools, Volume I, prepared for the Women's Action Program of the Department of Health, Education and Welfare, focuses on barriers to women's participation and success in eight health professions: medicine, osteopathic medicine, dentistry, veterinary medicine, optometry, podiatry, pharmacy and public health. The study's central purpose was to develop conceptual models of recruitment, admissions and other programs to maximize equal opportunities for women. The report contains data analysis, findings, conclusions and recommendations. 420 pages. COST: $4.80. ORDER FROM: Superintendent of Documents, Government Printing Office, Washington, DC 20402. (A 14-page executive summary and separate reports for each of the eight professions is also available. For further information write Women's Action Program, Department of Health, Education and Welfare, Washington, DC 20202.)

Additional information on women in medicine and health fields is available from:

American Medical Women's Association
1740 Broadway
New York, NY 10019

Association of American Women Dentists
435 North Michigan Avenue, Suite 1717
Chicago, IL 60611

Center for Women in Medicine
The Medical College of Pennsylvania
3300 Henry Ave.
Philadelphia, PA 19129

Women's Veterinary Medical Association
Dorothy Gustafson, Executive Secretary
2175 West Highway No. 36
Roseville, MN 55113

Law

The number of women enrolled in law school more than tripled between 1969-70 and 1974-75. The National Center for Education Statistics reports that women were 7.5% of first year enrollments in 1969-70, but by 1974-75, they comprised 23.4% of first year enrollments. Several law schools have published booklets to encourage women to prepare for careers in law:

Women and Law, from the Stanford Law School, discusses opportunities in the field, and destroys some of the myths about women in the profession. 7 pages. COST: Single copies free. ORDER FROM: Stanford Law School, Office of Admissions, Stanford, CA 94305.

Wanted by the Law: Women was written by the Boalt Hall Women's Association of the School of Law at the University of California, Berkeley. The booklet describes various specializations in law, and gives details about application and admission procedures. The booklet also deals with the unique problems of "older" women applying to law school. 15 pages. COST: Single copies free. ORDER FROM: Boalt Hall Women's Association, School of Law, University of California, Berkeley, CA 94720.

Women and the Law, published by the Golden Gate Law School Women's Association, includes special sections on women with children, minority women, and older women planning careers in law in addition to information on admissions, financial aid, job placement and housing. Although written for the San Francisco Bay area, much of the information is transferable. 14 pages. COST: Single copies free. ORDER FROM: Golden Gate Law School Women's Association, 536 Mission St., San Francisco, CA 94105.

Additional information on women in the law profession is available from:

Section on Women in Legal Education
Association of American Law Schools
Jane M. Picker, Chair
Cleveland State University
Cleveland, OH 44115

Engineering and Science

The number of women studying engineering in the United States has more than quadrupled in the last five years. Major universities well-known for engineering education have reported startling increases in the number of women enrolled. For example, Purdue University (IN) had only 40 female engineering students in 1967, but in 1975, the number had increased to about 462, including some women graduate students. The U.S. Engineering Manpower Commission reports that in 1975, women comprised 9% of the freshman engineering class.

The increase of women in science has been more marked. The National Science Foundation reports that the number of female graduate science students enrolled full time rose 13% between 1974 and 1975. This was more than twice the rate of increase in male students. (Even so, there are more than three times as many male as female students in graduate programs in science.) This increase in women science majors is also reflected on the undergraduate level. The Women's College Coalition (a group of 65 colleges with enrollments of predominantly women) reports dramatic increases in course enrollments in biology, chemistry and mathematics.

The following materials have been used by many institutions to interest women in engineering and science:

Consider the Possibility, prepared by the Stanford University School of Engineering, offers reasons for women to consider careers in engineering. Quotations from Stanford women engineering students help to dispell some of the myths about the field.

14 pages. COST: Single copies free. ORDER FROM: School of Engineering, Stanford University, Stanford, CA 94305.

Womengineer, written by Sara Jane Neustadtl for the College of Engineering of the University of Illinois at Urbana-Champaign, tackles myths about engineering and femininity head-on. The author describes the necessary qualities for engineering, what to expect as a student, how to apply to a college of engineering, and what it is like to be a professional engineer. 16 pages. COST: $.25. ORDER FROM: Engineers' Council for Professional Development, 345 East 47th St., New York, NY 10017.

Women's Work: Engineering, is a sound and color 16mm film which explores the experiences of being an engineer and a woman from the perspectives of students, faculty, and professionals. Guides for the teacher and student accompany the film. 26 minutes. COST: 5-day rental, $30.00; purchase, $295. Educator's guide, $1.00 each; student guide, $.50 each. ORDER FROM: MIT Center for Advanced Engineering Study, Dept. 4, Room 0-234, Massachusetts Institute of Technology, Cambridge, MA 02139.

Women in Engineering: Directory of College/University Programs, prepared by the Women's Action Group of the American Society for Engineering Education, describes programs in 115 schools. Designed for use by high school counselors as well as advisors in institutions of higher education, the booklet gives information on scholarships and fellowships for entering women students and graduate women; conferences for high school women sponsored by the institution during the academic year; summer program for high school women; and the availability of special recruiting material and other support programs. First-year and total enrollment of women for each institution is given. 32 pages. COST: $.50 prepaid. ORDER FROM: American Society of Engineering Education, Suite 400, One Dupont Circle, Washington, DC 20036.

I'm Madly in Love with Electricity and Other Comments About Their Work by Women in Science and Engineering is a career booklet published by Lawrence Hall of Science of the University of California, Berkeley. The booklet includes quotes and photographs of seventy women who work in private corporations, government laboratories, and colleges and universities. Also included are the names and addresses of 160 women scientists and engineers in California who are willing to act as resource people to students, teachers and parents. The booklet also lists publications and organizations where additional information may be obtained. 37 pages. COST: Single copies free; additional copies $1.00 each. ORDER FROM: Regents, University of California, Lawrence Hall of Science, University of California, Berkeley, CA 94720, Attn: Careers.

"Recruiting and Keeping Women Engineering Students: An Agenda for Action" by Betty A. Sproule and Harold F. Mathis in *Engineering Education*, April 1976, discusses some proven techniques used to attract women to engineering and to help retain those women after they are enrolled. COST: $.50 prepaid. ORDER FROM: American Society for Engineering Education, Suite 400, One Dupont Circle, Washington, DC 20036.

"How Colleges Try to Attract More Women Students" by Donna S. Frohreich in *IEEE Transactions on Education*, Vol. E-18, No. 1, February 1975, reviews efforts made to recruit women and some of the problems encountered in retaining women students. The author outlines what an institution must do to initiate and carry out a successful recruiting program for women. 6 pages. COST: $.30 per page for xerox copies, plus $3.00 for handling and postage. ORDER FROM: Engineering Societies Library, 345 E. 47th St., New York, NY 10017.

Women in Science and Technology: A Report on an MIT Workshop prepared by Edith Ruina, targets secondary schools and employers as the institutions that can bring about increases in the numbers of women in technical fields. The report outlines proposals for changes, calls for cooperative programs between employers and institutions, and provides many recommendations that can be utilized by colleges and universities as well as high schools to interest women in science and engineering. 39 pages. COST: $2.00 each. ORDER FROM: Edith Ruina, Workshop on Women in Science and Technology, Room 10-140, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, MA 02139.

Women in Science and Technology: Careers for Today and Tomorrow answers such questions as "why haven't more women considered careers in science and technology?", "what characterizes young women who become scientists and technologists?", "are careers compatible with family life?", "what steps can you take to plan a successful career?" Designed to stimulate interest in scientific and technical careers, the booklet includes pictures of women in those fields, and a list of resources for further information. 16 pages. COST: $1.50. Bulk rates available. ORDER FROM: American College Testing Program, Publications Dept., 2201 North Dodge Street, P.O. Box 168, Iowa City, IA 52240.

Women in Science and Engineering: WHY NOT, published by Women in Science and Engineering (WISE) at California State University, Northridge, describes the fields of biology, chemistry, computer science, engineering, mathematics, and physics, and gives statistics on the participation of women in those fields. Required high school background is given for each discipline, and there is a special section on the returning mature woman student. 10 pages. COST: $.35. ORDER FROM: Pat Wiggenhorn, Women in Science and Engineering, School of Engineering and Computer Science, California State University, Northridge, 18111 Nordhoff St., Northridge, CA 91324.

"Experimental Project in Physics Education or New Avenues for Women" by Betty L. Pollak and Lee K. Little, in *The Physics Teacher*, Vol. 11, No. 7, October 1973, reports on the "new avenues" program at the University of Oklahoma which was established to interest and train women in physics. The recruitment, courses, laboratory, and counseling components of the program are described and evaluated. The article also reports the evaluation of the program by faculty and graduate students and the "new avenues" students themselves. 10 pages. Back issues available. COST: $5.00 prepaid. ORDER FROM: American Institute of Physics, 335 East 45th St., New York, NY 10017.

Women in Science, a multi-media package, was prepared by Dinah L. Moche for the American Association of Physics Teachers. Six women with careers in science and engineering were asked such questions as "how did you first become interested in science?", "what were your experiences as a woman science student in college?", "how did you pay for graduate school?" and "what would you advise a young girl considering a career in science?" The package includes audio cassettes, slides, biographical sketches and lists of references. COST: $27.50 per set. ORDER FROM: Publications Department, AAPT Executive Office, Graduate Physics Building, SUNY at Stony Brook, Stony Brook, NY 11794.

Science: A Man's Job? in the October 1973 issue of the *Professional Bulletin*, Vol. 1, No. 2, of the Federation of American Scientists. It reviews barriers preventing women from entering scientific fields, superstitions about women workers, and gives recommendations for educating and employing women in science. 8 pages. COST: Single copies free. Supply limited. ORDER FROM: FAS Professional Bulletin, 307 Massachusetts Ave., NE, Washington, DC 20002.

Women in the Sciences, a Library of Congress Science Tracer Bulletin compiled by Constance Carter, is a guide to sources chronicling the history and contributions of women in the field of science. Although not a recruiting publication, it is a useful guide to persons who may be preparing recruiting material or planning workshops and other activities. 11 pages. COST: Single copies free. Supply limited. ORDER FROM: Reference Section, Science and Technology Division, Library of Congress, 10 First St., SE, Washington, DC 20540.

Further information on women in engineering and science can be obtained from the following organizations:

American Society of Biological Chemists
Committee on Equal Opportunities for Women
Ann E. Kaplan, Chair
Building 6, Room 114
National Institutes of Health
Bethesda, MD 20014

American Society for Cell Biology
Women in Cell Biology
Contact: Susan Goldhor
Dean of Natural Sciences
Hampshire College
Amherst, MA 01002

Women in Science Program
National Science Foundation
1800 G St., NW
Washington, DC 20006

Office of Opportunities in Science
American Association for the Advancement of Science
1776 Massachusetts Ave., NW
Washington, DC 20036

Women Chemists Committee
American Chemical Society
1155 16th St., NW
Washington, DC 20036

Society of Women Engineers
United Engineering Center
345 East 47th St.
New York, NY 10017

American Society for Microbiology
Committee on the Status of Women Microbiologists
Elizabeth M. O'Hern, Chair
633 G St., SW
Washington, DC 20024

Women's Action Group
American Society for Engineering Education
Donna Frohreich, Chair
Assistant Professor of Engineering
University of the Pacific
Stockton, CA 95211

American Physical Society
Committee on the Status of Women in Physics
Caroline Herzenberg, Chair
National Laboratory, Building 316
Argonne, IL 60439

Association for Women in Science
1346 Connecticut Ave.
Suite 1122
Washington, DC 20036

Math

The Census Bureau reports that the percentage of women among undergraduate students majoring in mathematics or statistics increased from 34.3% in 1972 to 44.6% in 1974. Additionally, as more women consider scientific and technical careers, they will need to take mathematics courses as part of their preparation.

The following publications may be of special help in planning math anxiety programs or summer programs and conference workshops in mathematics.

Mathematics and Sex by John Ernest, examines student attitudes towards math from second grade to high school, the attitudes of math teachers, and sex differences in the extent of mathematics education in high schools and at the college and university level. The study draws some conclusions and presents recommendations for improving the math education of women and increasing the number of women mathematicians. 30 pages. COST: Single copies free. Supply limited. ORDER FROM: John Ernest, Mathematics Department, University of California, Santa Barbara, CA 93106.

"Furthering the Mathematical Competence of Women," by Nancy Kreinberg in *Public Affairs Report*, Vol. 17, No. 6, December 1976, analyzes obstacles to women's barriers. Kreinberg recommends ways to improve learning opportunities in mathematics

for women. 6 pages. COST: Single copies free. ORDER FROM: Public Affairs Report, Institute of Governmental Studies, 109 Bernard Moses Hall, University of California, Berkeley, CA 94720.

Parents: Protect Your Children's Future. Have Them Take Algebra and Geometry in High School, is a brochure prepared by The Third College of the University of California, San Diego. The brochure discusses attitudinal problems in mathematics and the necessity of the essential courses in mathematics for both non-college bound and college-bound students. Although brief, the brochure is especially useful with parents, counselors and students. Foldout. COST: Single copies free. ORDER FROM: The Third College, University of California, San Diego, La Jolla, CA 92093.

Further information on mathematics and math learning is available from:

Association for Women in Mathematics
Lenore Blum, President
Department of Mathematics
Mills College
Oakland, CA 94613

Math Advisory Committee
Advisory and Learning Exchange
1101 15th St., NW
Washington, DC 20005

Math Clinic
Sheila Tobias, Associate Provost
Wesleyan University
Room 547 Science Tower
Middletown, CT 06457

Math Anxiety Program
Lillian Faderman, Project Administrator
Assistant Vice President for Academic Affairs
California State University
Long Beach, CA 93740

Miscellaneous

Women in Non-Traditional Occupations–A Bibliography, prepared for the U.S. Office of Education, Department of Health, Education and Welfare, was designed for use by educators and planners in vocational education, but can be used by personnel in colleges and universities as well. The three sections of the bibliography list overview materials, materials on women in skilled trades, and materials on women in professional occupations. A list of other resources is included. 189 pages. COST: Single copies free. Supply limited. ORDER FROM: Bureau of Occupational and Adult Education, U.S. Office of Education, Room 4147, 400 Maryland Ave., SW, Washington, DC 20202.

Careers for Women is a series of pamphlets published by the Women's Bureau of the Department of Labor. Each pamphlet describes the personal qualities and interests needed for success in each career, the advantages of each career, training needed and where to write for more information. Pamphlets are available on medical technology, urban planning, engineering, pharmacology, mathematics, technical writing, personnel and trade apprenticeships. COST: Single copies free. ORDER FROM: The Women's Bureau, Department of Labor, Washington, DC 20210.

IV. RESOURCES OF SPECIAL INTEREST TO MINORITY WOMEN

With some exceptions, Asian American, Black, Native American and Spanish speaking women are the minority of the minority population in scientific, technical and professional fields. Enrollment figures from the Department of Health, Education and Welfare show that minority women from all ethnic backgrounds are outnumbered by their minority brothers in professional school enrollment by more than three to one.

Because minority women generally have a higher labor force participation rate than do white women, it is especially important that they have access to training for well-paying occupations. Programs aimed at recruiting women and/or minority students may need special efforts to recruit minority women. Minority women and those that teach and counsel them may find helpful the various programs, publications and other resources directed toward recruiting minority students (as well as efforts designed to recruit women in general). Some of these resources are listed below.

Publications

AKA Heritage Series, brochures published by Alpha Kappa Alpha, a black sorority with a strong education and public service focus. The brochures present profiles of contemporary black professional women in business, medicine, dentistry, the judiciary and politics. The series has been widely distributed and used by teachers and counselors. COST: prices vary. FOR FURTHER INFORMATION: Alpha Kappa Alpha Sorority, 5211 South Greenwood Ave., Chicago, IL 60615.

Black College Graduates and the Job Market in the South, 1980, by Eva C. Galambos, forecasts job opportunities for black graduates where job openings exceed the overall supply of college graduates, and in areas where blacks are especially underrepresented. Fields discussed include health specialities, engineering, accounting, computer science and public administration. 30 pages. COST: $1.50. ORDER FROM: Southern Regional Education Board, 130 6th St., NW, Atlanta, GA 30313.

The Black Collegian, Vol. 7, No. 4, March/April 1977, is a special issue on employment and includes an article on banking careers, a job index and occupational outlook. The periodical, published five times yearly, regularly reports on educational and career opportunities for black college students, and usually contains articles on individual blacks in non-traditional careers who are

role models. COST: 2-year subscription, $10.00, 3 years, $12.00. ORDER FROM: Black Collegiate Services, 3217 Melpomene Ave., New Orleans, LA 70125.

The Doubie Bind: The Price of Being a Minority Woman in Science by Shirley Mahaley Malcom, Paula Quick Hall and Janet Welsh Brown, is a report of a conference of 30 black, Puerto Rican, Native American and Mexican American women scientists. Conferees discussed the need for programs to support minority women in science, and the impact of sex stereotyping on minority women. The report covers the pre-collegiate experience, collegiate and professional education, career and professional experience, and the diversity of race and culture among minority women. Policy recommendations and a list of proposed projects are included. 70 pages. COST: $3.00. ORDER FROM: American Association for the Advancement of Science, 1515 Massachusetts Ave., NW, Washington, DC 20005.

Directory of Organizations in Engineering Programs for Minorities, published by the Committee on Minorities in Engineering, lists black, Hispanic and Native American engineering and technical societies, national and regional cooperative programs, scholarship and student service groups, and a variety of national educational and minority organizations. A bibliography on engineering education for minorities is also included. 116 pages. COST: Single copies free. ORDER FROM: Committee on Minorities in Engineering, Assembly of Engineering, National Research Council, 2101 Constitution Ave., NW, Washington, DC 20418.

The Howard Engineer, Winter 1976, is a special recruitment issue containing several articles by women students. The magazine is national in scope and is issued quarterly. The editorial staff is comprised of students, many of whom are women. 24 pages. COST: $.75. Annual subscription: $3.00. ORDER FROM: HOWARD ENGINEER, P.O. Box 668, School of Engineering, Howard University, Washington, DC 20059.

Minorities in Engineering, a quarterly newsletter published by the Committee on Minorities in Engineering, reports on programs and activities geared toward increasing the number of minority students and professionals in engineering. COST: Free subscriptions; contributions welcome. ORDER FROM: Committee on Minorities in Engineering, National Research Council, 2101 Constitution Ave., Washington, DC 20418.

Programs

Banking Education Centers have been established at two predominantly black institutions, Howard University and Texas Southern University, to help attract and train highly qualified minority men and women for careers as bank officers. Funded by the American Bankers Association and the two universities, the program awards a degree in Business Administration with a concentration in Banking and Finance. For further information contact:

Georgellen Muriel
Center for Banking Education
School of Business and Public Administration
Howard University
Washington, DC 20059

Kenneth H. Cobb
ABA Center for Banking
Texas Southern University
Houston, TX 77004

The Earl Warren Legal Training Program of the NAACP Legal Defense and Educational Fund, provides scholarships for black students in law schools. The program also administers an internship program. For further information contact:

Jack Greenberg, Director Counsel
NAACP Legal Defense and Educational Fund, Inc.
10 Columbus Circle
New York, NY 10019

Minority Engineering Education Effort (ME^3) makes available data collected from minority high school seniors which might be of help to institutions developing programs and strategies to increase minority enrollment and reduce attrition. ME^3 also provides information for career days, guidance and counseling programs, and can help institutions identify minority students interested in engineering. For further information contact:

Carole Morning
Minority Engineering Education Effort
345 East 47th St.
New York, NY 10017

Minority Introduction to Engineering (MITE) a program involving 27 colleges and universities, is designed to introduce students to engineering and to encourage more institutions to sponsor their own recruiting programs. The MITE programs consist of

a two-week, no-cost, on-campus experience which gives students the opportunity to do course work, attend lectures, perform laboratory experiences, take field trips and talk to professional engineers. More than 85% of those students who have participated in the program are now either enrolled in engineering or have plans to do so. For further information contact:

MITE
Engineers' Council for Professional Development
345 East 47th St.
New York, NY 10017

Is There a Future in Health Careers for Minority Group Americans?, asks the National Council of Negro Women in the brochure describing the council's Health Careers Program. Designed to increase the representation of minority group Americans into health fields, the program consists of recruitment, career guidance and consultation, participant support services, and assistance in securing financial aid. For further information contact:

Health Careers Program
National Council of Negro Women
815 Second Avenue, Suite 901
New York, NY 10017

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Prices quoted in this publication subject to change.